SPARROW Surface Water Quality Workshop

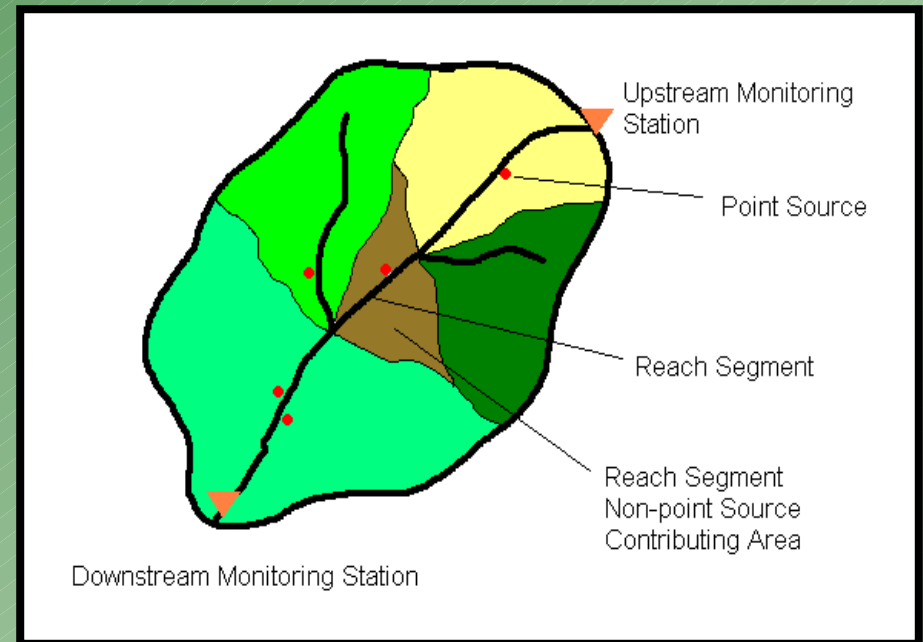## October 29-31, 2002
Reston, Virginia

Section 3. Overview of SPARROW Modeling Framework

USGS
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SPARROW Features

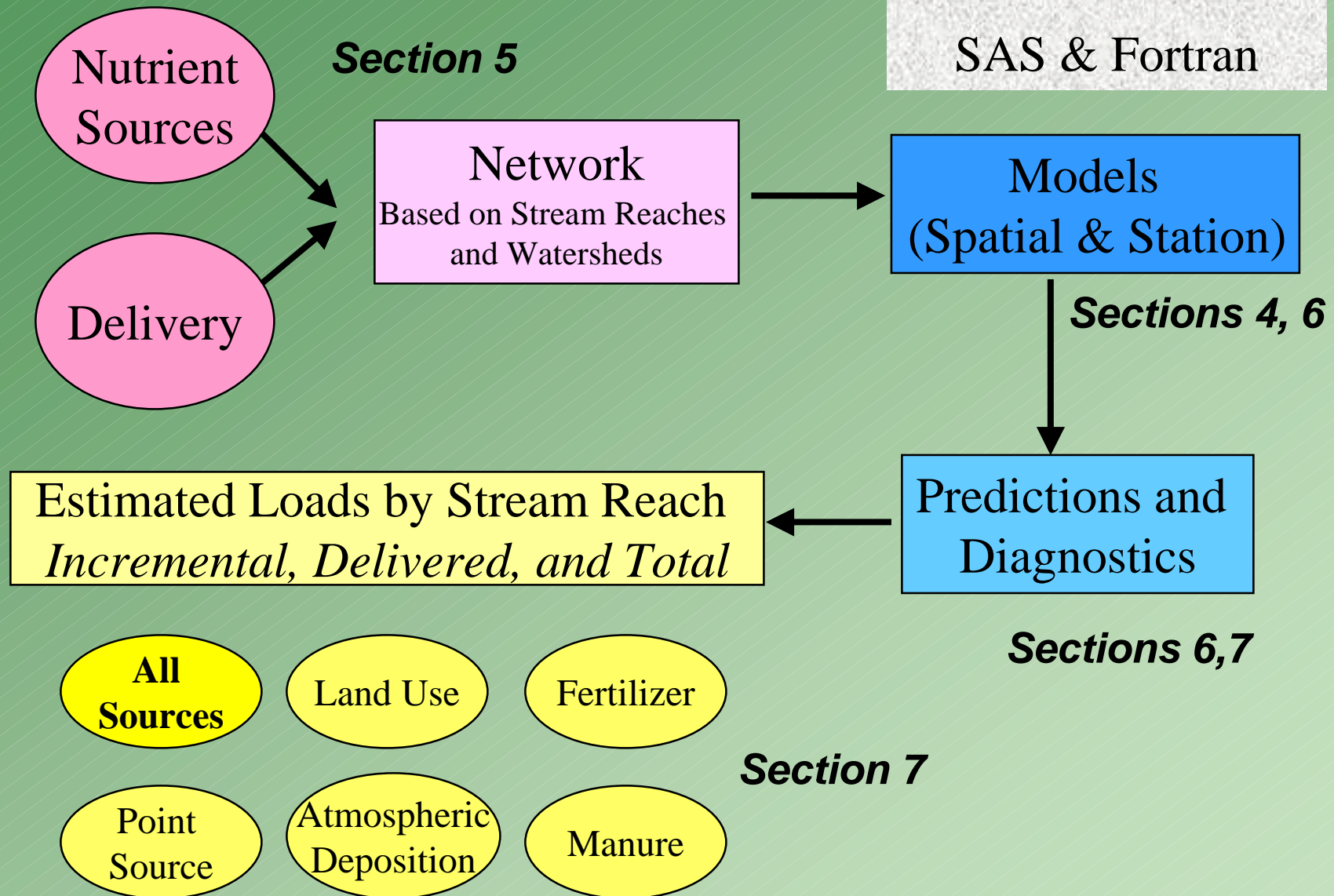## SPAtially Referenced Regression on Watershed Attributes

- Spatial referencing of watershed data to terrestrial and aquatic flow paths; separates landscape from surface-water features

- Simultaneous statistical (least squares) estimation of model parameters:
    - Spatial consistency of parameters and errors (e.g., reservoir and stream decay)
    - Unique parameter estimates (sensitive, uncorrelated)
    - Parsimonious model (complexity ne accuracy)
    - Uncertainty characterization (parameters, prediction CIs)

- Spatial mass balance constraints

- Mechanistic functions to constrain estimation and test hypotheses
    --Simple first-order decay functions

SPARROW Model Structure

Diffuse Sources

Industrial / Municipal Point Sources

Section 6

Section 4

Re-Estimate Coefficients

Landscape Transport

WQ / Flow Data
Periodic measurements at monitoring stations

Monitoring Station Load Calculation

Aquatic Transport
Streams
Reservoirs

Rating Curve Model of WQ Loads
Station calibration to monitoring data

Continuous Flow Data

In-Stream Load Prediction

Mean WQ Load Calculation

Calibration
Iterate to minimize differences between predicted and calculated mean loads at the monitoring stations

Evaluation of Coefficients & Predictions

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